Whence

$$\int_q^p f(x)dx = (p-q)\,f\left[\frac{p+q}{2}\right] + \tfrac{1}{12}(p-q)^3.$$

[*W. H. Echols.*]

Also solved by Messrs. Geo. R. Dean, Eric Doolittle, and H. Y. Benedict.

EXERCISES.

369

SOLVE the equation

$$\frac{d^2y}{dx^2} - y = e^{\frac{1}{2}x^2}.$$

[*Geo. R. Dean.*]

370

FROM a point A on the equator a northeast rhumb line is drawn; find at what latitude it again strikes the meridian of A, and express the length of the rhumb line in radii. [*James McMahon.*]

371

PROVE that the ratio of

$$\begin{vmatrix} \sigma_1(2u_1), & \sigma_1(2u_2), & \sigma_1(2u_3) \\ \sigma_2(2u_1), & \sigma_2(2u_2), & \sigma_2(2u_3) \\ \sigma_3(2u_1), & \sigma_3(2u_2), & \sigma_3(2u_3) \end{vmatrix}$$

to

$$\sigma(u_2+u_3)\,\sigma(u_3+u_1)\,\sigma(u_1+u_2)\,\sigma(u_2-u_3)\,\sigma(u_3-u_1)\,\sigma(u_1-u_2)$$

is independent of the arguments u_λ; and that its value is

$$4(e_2-e_3)(e_3-e_1)(e_1-e_2);$$

the notation being that of Weierstrass. [*Frank Morley.*]

372

WHEN the bilinear invariant of two binary n-ics is zero, we say that the n-ics are *apolar*. When also the n-ics coincide we say that either is self-apolar. And we may apply the same adjectives to the sets of n points (or n-*ads*) which represent the zeros of the n-ics. Any odd set of points is, we know, self-apolar (Salmon's Higher Algebra, § 153). Prove that an even set is self-apolar when the first polar of any point of the set, with regard to the rest, is self-apolar. [*Frank Morley.*]